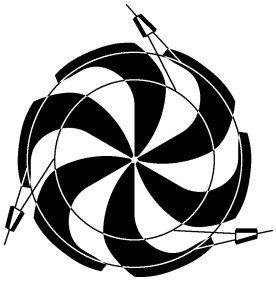
TRIUMF



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CANADA'S NATIONAL LABORATORY FOR PARTICLE AND NUCLEAR PHYSICS

OPERATED AS A JOINT VENTURE

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UNDER A CONTRIBUTION FROM THE
NATIONAL RESEARCH COUNCIL OF CANADA

OCTOBER 2005

The contributions on individual experiments in this report are outlines intended to demonstrate the extent of scientific activity at TRIUMF during the past year. The outlines are not publications and often contain preliminary results not intended, or not yet ready, for publication. Material from these reports should not be reproduced or quoted without permission from the authors.

TECHNOLOGY TRANSFER DIVISION

INTRODUCTION

The Technology Transfer Division at TRIUMF is responsible for the laboratory's commercial interactions. It is composed of a small group dedicated to optimizing the commercialization of technologies emanating from TRIUMF research, plus the Applied Technology group that is responsible for the operation of the on-site commercial cyclotrons on behalf of MDS Nordion.

TECHNOLOGY TRANSFER

The mandate of the division is the pursuit of all financially and technically viable opportunities for commercializing technologies emanating from the research at TRIUMF. This mandate must recognize the preeminence of the scientific research at the laboratory, and proceed in a manner that optimizes the impact on TRIUMF and the Canadian economy while minimizing the impact on scientific activities at the facility.

The current Contribution Agreement between the National Research Council (NRC) and TRIUMF includes the requirement for TRIUMF to enhance its impact on the Canadian economy. This impact is measured through the benefits provided to Canadian industry, both through the transfer of TRIUMF's technical knowledge and through its purchasing practices.

APPLIED TECHNOLOGY GROUP

500 MeV Isotope Production Facility

During this year, the 500 MeV irradiation facility received 327.6 mAh. Thirteen targets were irradiated, nine targets delivered to produce $^{82}Sr/^{82}Rb$ for MDS Nordion.

CP42 Facility

The total beam delivery for 2004 was 670 mAh. The weekly beam delivery graph is shown in Fig. 249, the quarterly time evolution of the beam delivery is shown in Fig. 250. The downtime and maintenance statistics are analyzed in Fig. 251 and compared with the TR30-1 and TR30-2.

The upgrade of the CP42 control system is nearing completion.

TR30-1 Facility

The total beam delivery for 2004 was 1982 mAh. The weekly beam delivery graph is shown in Fig. 252, the quarterly time evolution of the beam delivery is displayed in Fig. 250. The downtime and maintenance statistics are analyzed in Fig. 251 and compared with the CP42 and TR30-2.

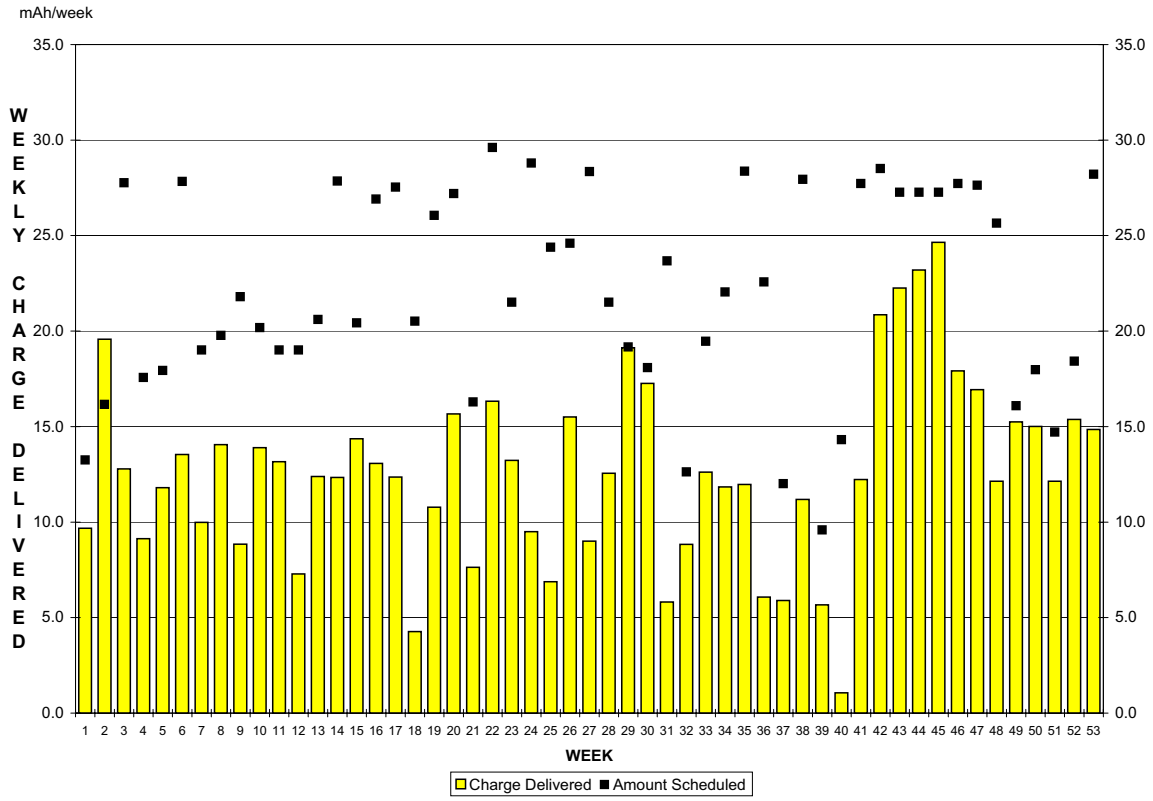

Fig. 249. Weekly beam delivery for the CP42.

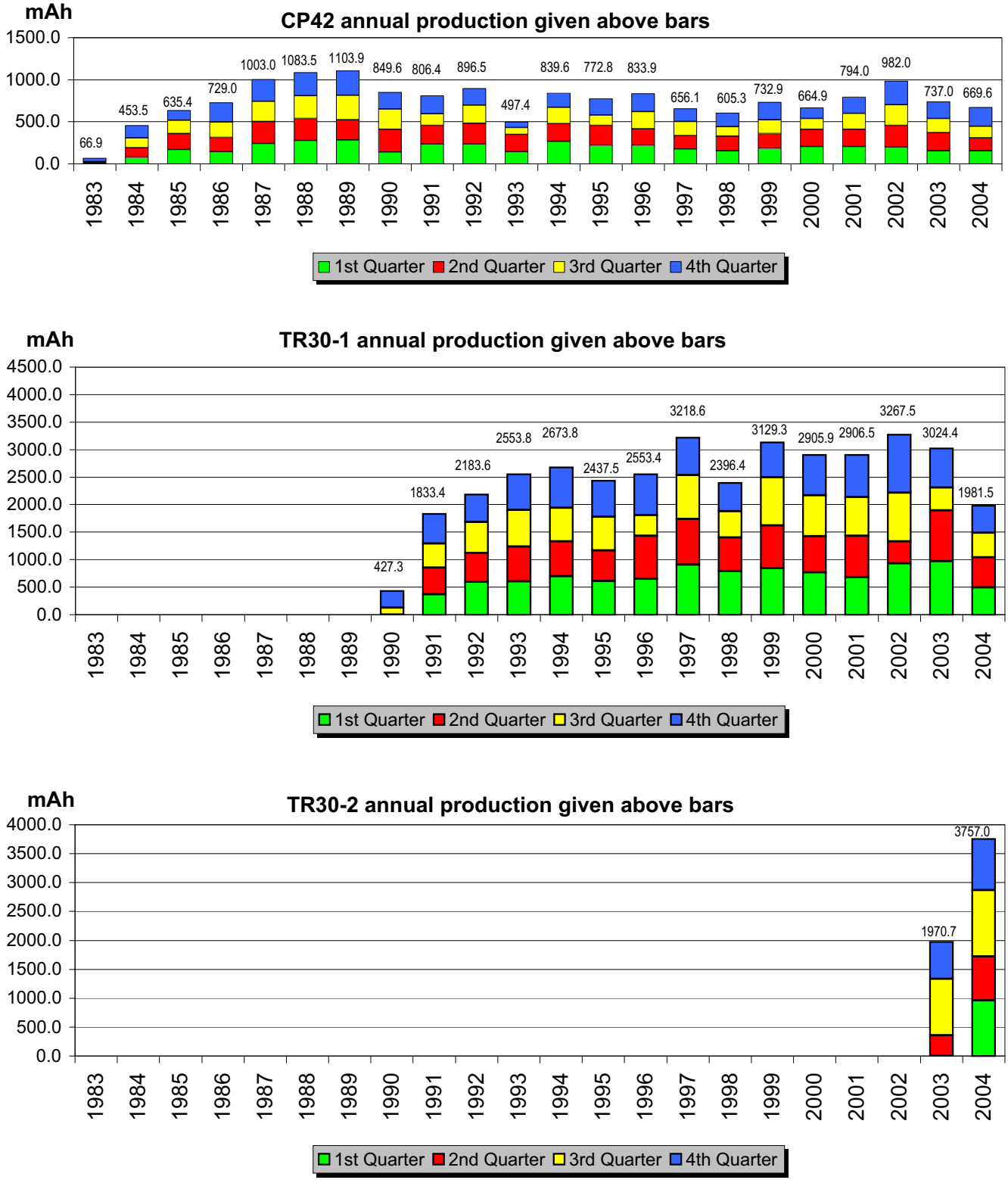

Fig. 250. Quarterly time evolution of the beam delivery for the CP42 (top), TR30-1 (middle) and TR30-2 (bottom).

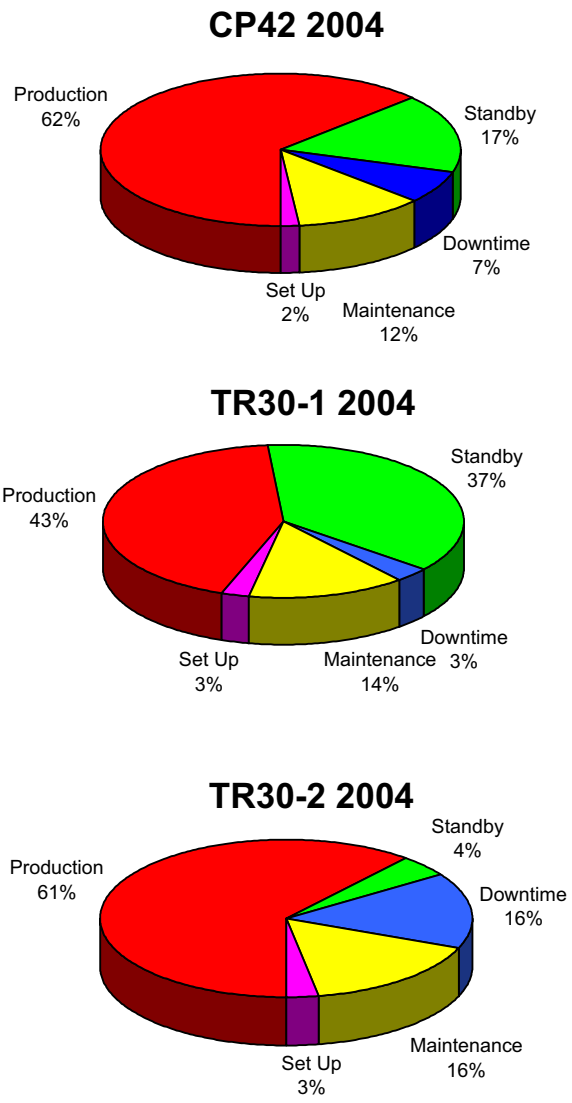

Fig. 251. Breakdown of downtime and maintenance for the CP42 (top), TR30-1 (middle) and the TR30-2 (bottom) during operational hours.

TR30-2 Facility

In 2004, the TR30-2 had the highest ever beam production of all ATG cyclotrons. The total beam delivery was 3757 mAh. The weekly beam delivery graph is shown in Fig. 253, the quarterly time evolution of the beam delivery is displayed in Fig. 250. The downtime and maintenance statistics are analyzed in Fig. 251 and compared with the CP42 and TR30-1.

ATG Development Projects

ATG is working towards a consolidation of the cyclotron control rooms. The CP42 and TR30-1 controls are scheduled to be moved into the TR30-2 control room by the end of 2005.

The upgrade of the CP42/TR30 Radiation Monitoring System has been completed. Work is in progress to replace the obsolete CP42 Access Control System.

Improvements to the existing solid target station collimators are in progress. The new design uses collimator heads manufactured from a specific high strength tantalum-tungsten alloy.

Collaborations are ongoing with the Université de Sherbrooke, Quebec, and the University of Washington Medical Center in Seattle.

RADIOISOTOPE PROCESSING (MDS NORDION)

During the year 2004, MDS Nordion shipped large quantities of short-lived medical radioisotopes produced using the two TR30 cyclotrons and the CP42 cyclotron. The main radioisotopes produced and shipped were iodine-123 used for thyroid imaging and research, palladium-103 used in prostate brachytherapy, and indium-111 used for monoclonal antibody imaging.

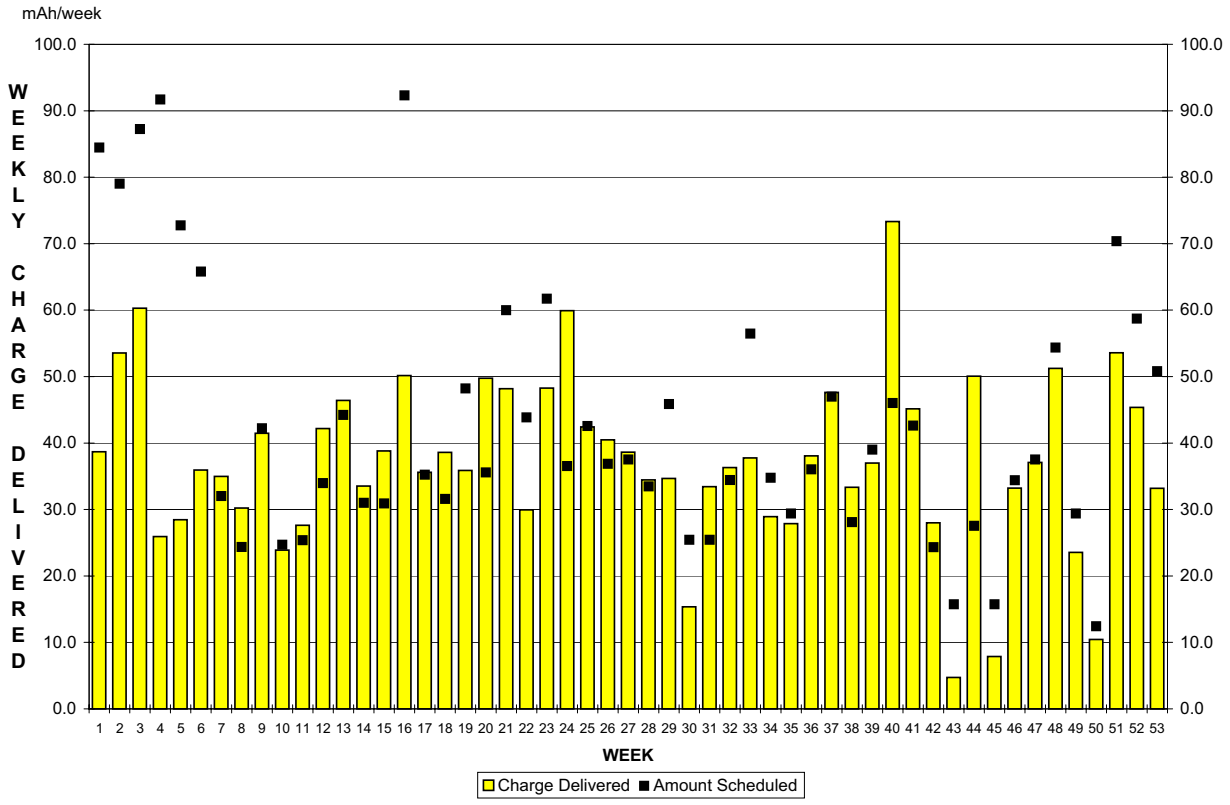

Fig. 252. Weekly beam delivery for the TR30-1.

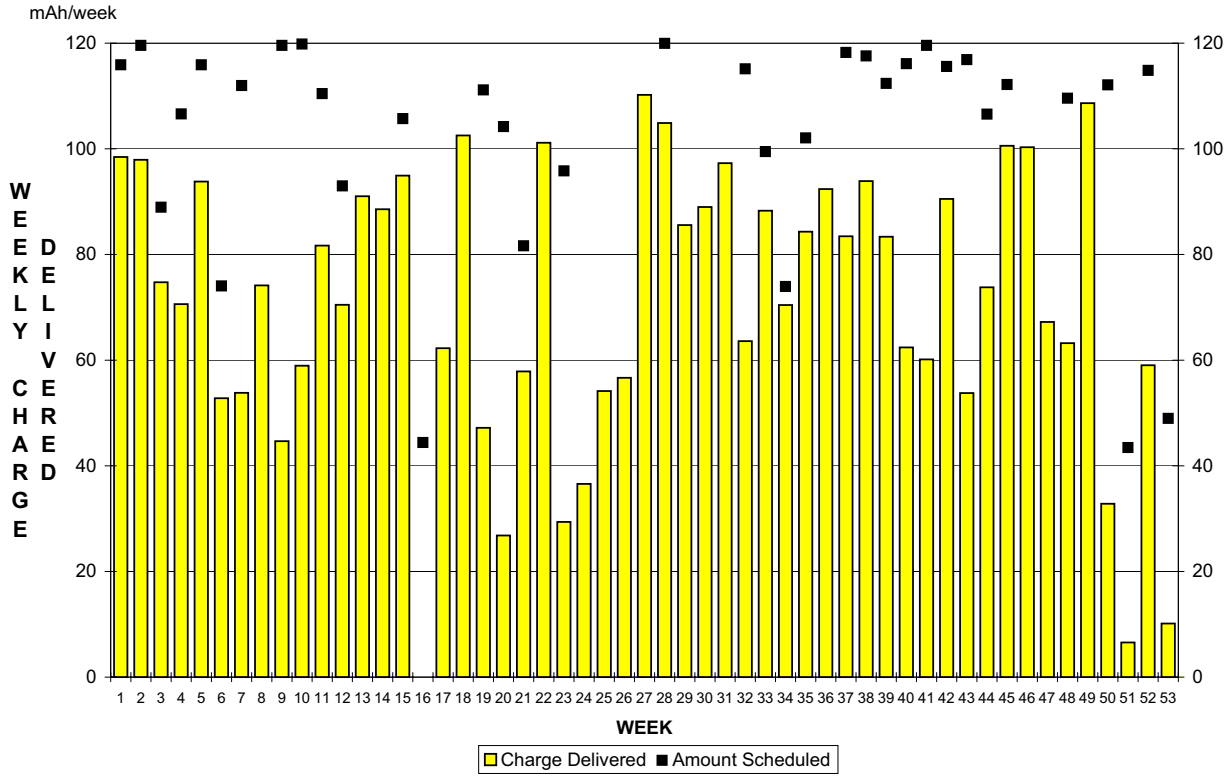

Fig. 253. Weekly beam delivery for the TR30-2.